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GEORGE J. MILLER, *Editor*

The JOURNAL *of* GEOGRAPHY

A MAGAZINE FOR SCHOOLS

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Dr. Parkins is known to all students and teachers of geography by his numerous magazine articles and by his textbooks. He is head of the department of geography in George Peabody College for Teachers; President of the Association of American Geographers; and associate editor of the JOURNAL OF GEOGRAPHY. The article presented this month is the first in our new series.

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Miss Foster is an instructor in the University of Chicago High School. Among her many contributions to the field of scientific geography and to geographic education may be mentioned the following. "Barbados: A Geographical Study of a Densely Populated Island in Tropical America," JOURNAL OF GEOGRAPHY, September, 1923; "A Geographical Interpretation of the Cotton-Manufacturing Industry of Orizaba, Mexico," *Bulletin of the Geographical Society of Philadelphia*, April, 1924; "Orizaba—A Community in the Sierra Madre Oriental," *Economic Geography*, October, 1925.

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The JOURNAL *of* GEOGRAPHY

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VOLUME XXIX JANUARY, 1930 NUMBER 1

AN EXPERIMENT IN GEOGRAPHIC WRITING

Most geographers agree that the central theme of geography deals with the relation of man to his natural environment. But in their writings they have tended to make environment the prominent feature and relegate man to a secondary position. *Explanations* of geologic, meteorologic, climatic, physiographic, and other features, have been made part of the discussion as if such explanations were an integral part of geography as defined. Also, even when explanations were minimized, it has been common practice to introduce a subject by an extended discussion of the natural environment giving the discussion a very strong geologic and physiographic flavor. In reply to any criticism the geologist usually says: Why *not* include geologic terms? The geographer is coming to say: Why include them when they have no geographic significance? For example, he says: Of what geographic significance are such terms as Carboniferous, Triassic, Cambrian, etc.? Presumably, in the course of time, there will arise a generation of geographers who will think and write in terms primarily of their subject as do other scientists. *Have we reached that stage in our evolution?*

The JOURNAL OF GEOGRAPHY is concerned primarily with geographic education rather than the abstract science of geography. It is interested in the possible preparation of material along new lines for educational use, especially for use below college level where most teachers have had little training in geography. Accordingly a plan was presented to numerous geographers thruout the country, and they immediately expressed their willingness to try it. Each author is free to select a region and develop the theme as he chooses. This will result in considerable variety of treatment and present many standards that may serve as guides in the future preparation of geographic material for educational purposes. Here is the plan as it was presented originally.

Dear Geographer:

We have a scheme in mind which we wish to present and ask your cooperation in carrying it out. We propose the preparation of a series of articles written on lines something like the following.

1. *Make man the prominent feature* of the discussion. This involves a discussion of the intimate relations of humans to their natural environment, the emphasis being placed upon the human relations rather than upon the description of the physical environment.

2. *Blend the environmental features,* such as climate, surface, rivers, floods, drought, etc., with the human relations in the narrative. We are not concerned at all with a scientific explanation of the physical environment. To illustrate we have in mind the exclusion of meteorological explanations of climate and weather, or geological explanations of surface features. *In other words, people are living in the midst of certain natural features that exist now and are being influenced by them, and we are concerned with the human manifestation of that influence.*

3. We hope to produce a clear-cut picture of just how people live in a particular spot on the surface of the earth.

4. We have in mind articles on a variety of subjects, e.g., an arid land, the hot moist tropics, an Arctic environment, a mountain environment, a river environment, et cetera. The complete series will thus illustrate the application of this method of writing to various types of subjects.

We are not attempting to define all of the places or topics concerning which an article could be written. The important thing we are driving at is a description of those intimate human reactions to the natural environment of a particular place. Such an article could easily be confined to an analysis of a village, even in a densely populated district of Europe; to a restricted valley area; to an occupation influenced by some particular physical feature; to life in the Kentucky mountains, etc., etc.

Now we come to a very important point in this letter. First, what do you think of the idea? Second, will you be willing to undertake the preparation of an article along these lines? Third, upon what topic will you consent to write? Fourth, on what date may we depend upon receiving your manuscript?

Briefly, the theme of this experiment may be expressed in another way. The purpose will be to weave human activities into the natural setting so that (1) man will occupy the prominent place in the discussion, (2) a clear picture of both the natural setting and man's occupancy will result, and (3) there will be shown clearly a causal relation between the two elements—natural environment and man. Again, the articles will fuse life activities and the elements of the natural environment to produce a clear picture of how people live in a given area and how the natural environment is affecting their living—a utilization of the landscape, as it were.

We hope to have many contributors to this experiment in geographic writing. As previously stated, each author is free to carry out his own ideas as nearly as his subject and the plan will permit. Exact uniformity is not expected, neither is it desired. We are after a new type of geographic writing to determine whether such a type can be more effective than past practice in preparing the materials of human geography for educational purposes. Among

the geographers who are now preparing articles for this series, or who have already completed them are the following.

Dr. A. E. Parkins, George Peabody College for Teachers. "The High Plains of Western Texas," which appears in this issue. Later Dr. Parkins will present an article on some unit area in the South.

Dr. Derwent Whittlesey, Department of Geography and Geology, Harvard University, "Human Occupance of the Lowest Rhineland."

Dr. D. H. Davis, Department of Geography, University of Minnesota, "A Study of the Succession of Human Activities in the Kentucky Mountains."

Dr. Langdon White, Department of Geography, Randolph-Macon Woman's College, "The Shenandoah Valley."

Dr. W. H. Haas, Department of Geography and Geology, Northwestern University. His article will deal with the Incas of Peru.

Dr. Preston E. James, Department of Geography, University of Michigan, will discuss human life on the southern margin of the Sahara.

Professor Harold C. Kemp, Department of Geography, Dartmouth College. Which one of several themes will be submitted finally has not been determined definitely.

Dr. Elmer Ekblaw, Department of Geography, Clark University, will prepare from one to three articles dealing with Arctic lands.

Professor R. H. Whitbeck, Department of Geography, University of Wisconsin, will discuss an area in Middle American.

Miss Floy Hurlbut, University of Nebraska, will discuss life relations in Fukein Province, China.

Dr. Clarence Jones, Department of Geography, Clark University, will present at least two articles dealing with the banana and coffee industries of Colombia.

Dr. Ralph H. Brown, Department of Geography, University of Minnesota, will discuss the geography of a mining area in the Front Range of the Rockies in Colorado.

Dr. Samuel Van Valkenburg, Department of Geography, College of the City of Detroit, will discuss one or more tropical areas.

Dr. William T. Chambers, Department of Geography, Stephen F. Austin State Teachers College, Nacogdoches, Texas, will discuss a rural cotton community.

These articles will appear from time to time during the next two or three years. The first to appear is the one by Dr. Parkins presented in this issue. No introductory article for the series has been prepared. No one has precedence over another. Articles will be published as they are completed and ready for the press. Dr. Parkins article appeared first simply because it happened to be ready first. From the material thus far presented, it is apparent that this series of articles is destined to make an important contribution to geographic education.

THE EDITOR

THE HIGH PLAINS REGION OF WESTERN TEXAS

A. E. PARKINS
George Peabody College for Teachers

LONG CONSIDERED ONLY A NATURAL PASTURE LAND

To anyone who today speeds along over the hundreds of miles of well graded gravel and asphalt roads of the High Plains region of western Texas the descriptions of this region in the better American atlases of the fifties and sixties of the last century make interesting reading. Colton's Atlas of the World, Vol. I, 1856, shows the High Plains area occupied by Kiowas and Comanche Indians. A note, printed on the map, runs as follows: "From the head waters of the Red, Brazos, and Colorado (in Texas) rivers to the Rio Pecos is a desolate, sterile plain, from 100 to 200 miles in width, elevated about 4,500 feet above the Gulf of Mexico, without water or timber and with a scanty vegetation." Mitchell's Atlas of 1866 describes the Llano Estacado or Staked Plains (that part of the High Plains that lies south of the Canadian River) as "destitute of both wood and water." Shaler in his Nature and Man in America writes of the Great Plains in general: "The absence of fuel, timber, and water power excludes manufacturing; the dryness renders extensive agriculture impossible; and there remains only the scanty industry which comes with a pastoral life."

The transformation which has come to this region, the last settled section of the great brown to black earth region of our country, during the last four or five decades is evidence of the skill and effectiveness of the American farmer (largely Southern in this region) in adjusting himself to new and seemingly hopeless situations.

Until the early eighties, the High Plains Region of Western Texas[1] was, for the most part, the abode of Indians and wild animals, the larger number of which were the buffalo, escaped domestic cattle

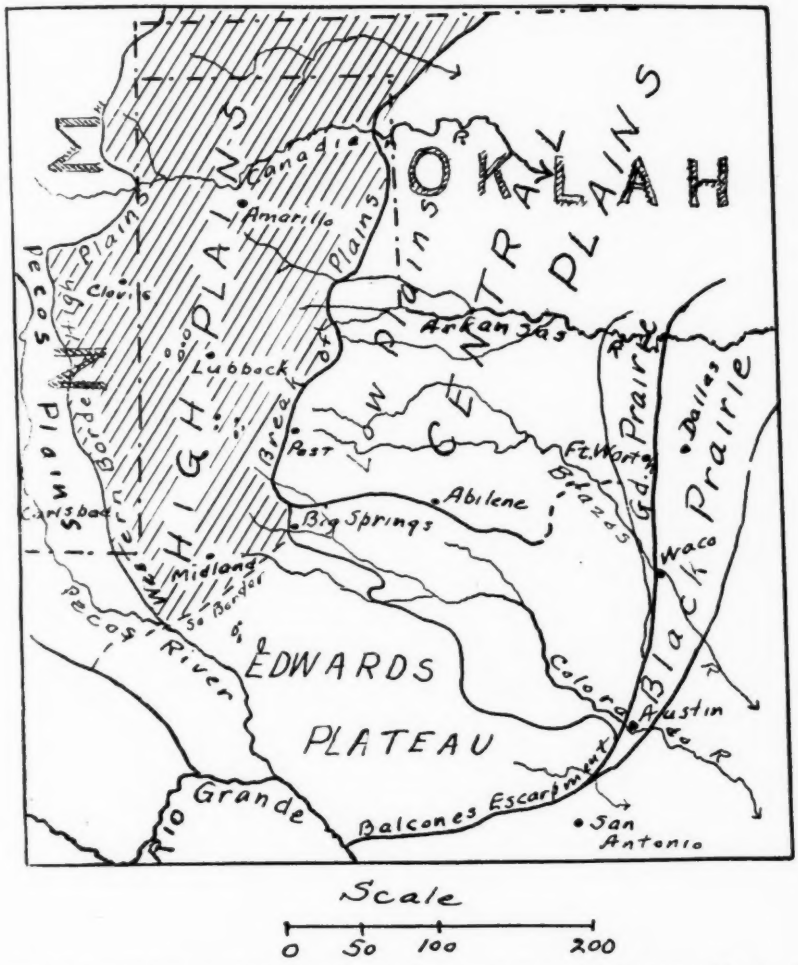

FIG. 1. Sketch map of High Plains of Western Texas. See Footnote No. 1. Boundaries of physiographic regions from Fenneman's Monograph (Annals A.A.G., Dec., 1929) and Hill and Vaughan's Austin (Texas) Folio.

[1] The High Plains Region of Western Texas is the southern portion of the higher western section of the Great Plains. South of the Canadian River the High Plains has long been called the Llano Estacado or Staked Plain. That portion of the High Plains which lies (roughly) north of the line from the southwestern corner of Oklahoma to the southeastern corner of New Mexico is called the Panhandle of Texas. The eastern edge of the High Plains of Texas is the "Break of the Plains." On the southern border the High Plains grades off into the more sterile Edwards Plateau. The line of demarcation

and horses from Mexico, and the coyote. Only three counties out of the fifty or more now set off were organized before 1880, and only seventeen were organized by 1890.

INVASION OF SOUTHERN CATTLE MEN AND FARMERS

In the early eighties, many experienced cattle men, largely from the Black Prairie, Grand Prairie, and the Low Plains of Texas, with large herds of long-horned cattle, invaded the High Plains. Some tracts were "homesteaded"; others leased; and many were purchased. Some few of the land holdings, acquired largely by purchase, were immense, consisting of 1,000,000, 2,000,000, or even 3,000,000 or more acres. But the cattle men were not to remain long in control of such immense domains. In the late eighties and early nineties, following the construction of the Fort Worth and Denver Railroad (1887), farmers from Texas and other Southern states began encroaching upon the ranchers. There are few large holdings today. The ranch owners have found it more profitable to break up

Changing Agricultural Conditions in Lubbock County, Texas

Year	Number of farms	Percentage of area in farms	Improved acreage	Value of farm property
1900	46	—	3,768	$ 1,208,868
1910	208	50	27,561	$ 5,617,779
1920	1,009	70	126,909	$19,272,251
1925	2,037	77.7	231,230	$23,684,676[2]

their immense holdings and sell the land to land-hungry farmers who are willing to pay many times the original cost to the cattle men.

The rapidity with which the area was transformed from a grazing region to an agricultural is well illustrated by the changes in Lubbock County, one of the best agricultural counties of today and having an area of 555,520 acres.

is indistinct and irregular but extends, roughly, from the southeastern corner of New Mexico toward Austin, Texas, which lies on the lower land some distance beyond the foot of the Edwards Plateau, the eastern escarpment of which is known as the Balcones Escarpment. The western edge of the High Plains lies well over toward the Pecos River in New Mexico. The High Plains of Western Texas extends, of course, only to the New Mexican boundary line. See Fig. 1.

[2] The value of farm property in the United States decreased from $66.3 billion in 1920 to $49.5 billion in 1925.

THE AGRICULTURAL LANDSCAPE OF TODAY

Most of the High Plains Region is in farms today.[3] In most counties it is the crop land with crops of grain and forage sorghum, corn, cotton, and wheat that gives color to the landscape. There are a few large ranches mainly in the Sand Hill section, that lies just to the south of 34° north. (Bailey, Cochran, and Lamb counties.)

The landscapes in the better agricultural sections have a strong resemblance to those of the prairies of Illinois, Iowa, and northern Missouri. The horizon is a perfectly straight line. The foreground and middle ground of the landscape are low swells, low uplands and

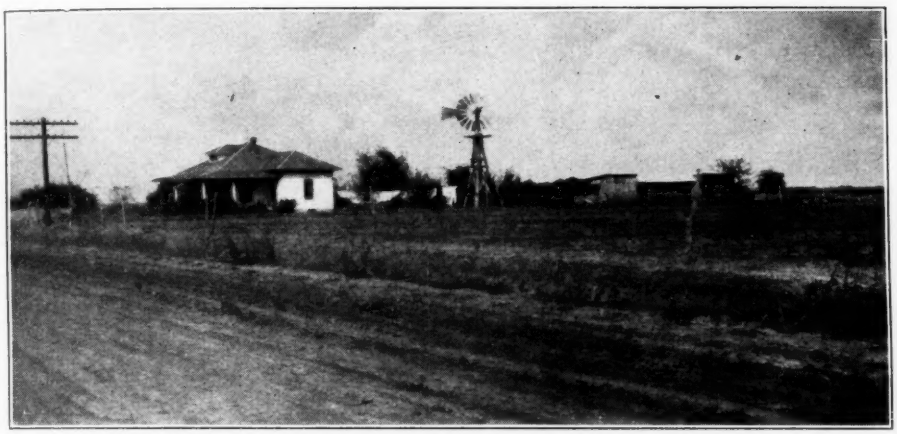

FIG. 2. A farm home on the High Plains near Lubbock, Texas.

shallow depressions. From the top of the low uplands, one has under view an area of 100 or more square miles of almost continuous crop lands or cultivated lands left in pasture, the monotony of which is broken only here and there by a small farm house with its accompanying windmill, water tank, a few outbuildings, and a few shade trees. The houses and barns are smaller than the average on the Illinois prairie. Lumber is expensive in this region, the more extensive commercial forests being in eastern Texas. Besides, the first generation in newly settled regions, being largely the debtor class, finds contentment in small abodes. Democracy is more uniform, because wealth is more equally distributed. Sufficient time

[3] The percentages of total area in farms in a few counties are as follows (selected at random): 18.6, 23.8, 46.5, 51.7, 65, 85.5, 98.1, 85.5, 74.7, 98.6, 72.9, 56, 85.4. These data compare favorably with other parts of the South. The data are for 1924, taken from the Census of Agriculture, 1925.

has not yet elapsed for the more successful to make a showing of their wealth in the form of larger and more pretentious residences. Even the residential sections of the cities and towns of the High Plains are characterized by small yet comfortable-looking houses.

THE TYPICAL FARM HOME

The average farm home is the one-story cottage type, modern in its architectural lines, frame, and neatly painted. Many have small porches. As a rule, the house is built near the road. Not a few homes are equipped with electricity (or oil or natural gas), particularly

FIG. 3. Looking northwest from eastern edge of the High Plains near Post, Texas. On the right is a cotton field, on the left pasture land. A farm home may be seen in the middle background.

in broad belts connecting the larger cities. Little land is devoted to a front yard. Beside most houses there is a vegetable garden in which grow beans, peppers, tomatoes, potatoes, and turnips. Also there may be a few peach trees, a few grapevines, and berry bushes. Behind the house is the inevitable windmill that lifts water, generally slightly brakish or "gypy," to the wooden or galvanized iron tank, elevated some 6 to 10 feet to supply running water in the house and the barnyard. Most of the windmills are of wood. Noisy steel windmills would prove unbearably boresome during the almost continuous operation essential to keep the water tanks filled. The lightning rod (or rods) on the home is about as characteristic of the High Plains as the windmill. Whether its universality is due to the enterprise of lightning rod agents or to the forethought of the farmer the writer did not determine; but it is an adjustment natural to

a flat country where the house is the highest and most frequent feature of the landscape and, therefore, the most likely to be struck by lightning if not protected. The barns and outbuildings are numerous but small. The type of crop, the infrequency of rain, and the moderate winter are elements of the environment that enable the farmer to get along without the expense of large barns. The barn is usually smaller than the house. Few even have lofts for the storage of fodder. They are used to shelter a few horses, mules, and a

FIG. 4. A field of grain sorghum. Native grasses in the foreground. A farm home in the background.

few milk cows, if there are any of the latter. The barnyard or corral on most farms is small. On many farms, the windward side of the corral is a solid board fence that gives some protection from the occasional cold winter "norther." Among the farm buildings, there may be a poultry-house, an implement-house, a garage, and possibly a granary. With crops that are fall harvested, there is little need of extensive storage space. Where Mexican labor is employed there may be a bunk-house, set somewhat apart from the group of farm buildings. Extending to the left, the right, and behind these farm buildings, are the fields and pasture lands.

The average area of the farm varies greatly in the various coun-

ties. In some counties, it is only about 200 acres, but in most the average runs from 500, to 800, 1,000, or even 1,500 acres. The area of crop land in the better agricultural counties is generally far larger than pasture, but in most counties the crop land may measure from one-half to one-sixth of the pasture land. Much of the pasture land is classed as plowable; that is, it could be plowed and used for crops without drainage or irrigation. It, therefore, may be classed as improved pasture land.

ADJUSTMENTS TO A LOW RAINFALL IN THE HIGH PLAINS REGION

The first farming adjustments to a low rainfall in the High Plains Region was largely supplementary to the cattle industry. Milo

FIG. 5. A cotton field west of Lubbock, Texas. The plants shown in this photograph are only about eighteen inches high.

maize, Kafir corn, and other sorghums were grown to feed the cattle during the periods of adverse weather conditions. Some ranchers raised their own cattle feed; others purchased it from farmers whose interests were more in agriculture than in cattle raising. One finds various types of land utilization today from pure ranching to general farming. There is a tendency among farmers who specialize in cattle production to grow feed for adverse winters. The farmer who practices general agriculture has some cattle, but his interest is in crops of the drought-resisting sort, such as hard winter wheat, the sorghums as Kafir corn, feterita, sorgo, and milo maize, also alfalfa, corn, cotton, and oats.

The celebrated long-horned Texas cattle exist today only in picture books or on postal cards or in zoos. The Hereford or whiteface is the universal beef breed in all west Texas. Near the cities where there is a market for milk and cream, one finds herds of Jerseys. Both types are of excellent quality and, comparatively,

of pure breed, the dairy herds less so than the beef cattle indicating the greater interest in beef production. Fort Worth, Kansas City, St. Louis, and Chicago are the markets for fat cattle. Before the widespread cultivation of dry farming fodders, the cattle were shipped to the Corn Belt to be fattened; but more and more farmers are finishing their cattle for market and thus reaping greater profits.

WHEAT

Most of the wheat acreage in Texas is in the northern half of the High Plains, the southwestern margin of the hard wheat region that centers in Kansas. In wheat growing the land is generally fallowed during the summer preceding the sowing of wheat as is done in many a dry farming region. Fall-sown wheat serves as a cover crop that prevents the blowing of sand and silt during the windy dry spells. Wheat culture is rather new to the High Plains Region, but its acreage is increasing. The yield per acre in most years exceeds the average for the United States but falls below during years of drought. The scarcity of labor makes the use of large-sized machinery necessary. Tractors, gang-plows, and combines are increasing in numbers on the wheat farms. Grain elevators are to be found at most railroad stations in the wheat region.

THE SORGHUMS

The more certain crops are the sorghums, well adapted to semi-arid conditions and yielding good returns at least where some dry-farming practices are followed. The deep, mellow, porous, chocolate-brown soil, when plowed deeply and kept porous by frequent cultivation, gives a heavy yield in most years. Frequent cultivation is possible and necessary with most of the sorghums and corn. In 1919 the High and Low Plains of Texas and nearby portions of Oklahoma produced nearly all of the sorghums grown in this country. The world has been searched for the many varieties adapted or capable of being adapted to American climate and soil. Some sorghums have been introduced from the dry belts of Africa as their names indicate. Broom corn is grown by many farmers, but by far the non-saccharine sorghums grown for grain and fodder take precedence over all other varieties . The grain sorghums are harvested by heading much as is wheat and marketed quite often before threshing. At many stations and in farm-yards in the High Plains

Region one may see in the fall great brown stacks or ricks of grain sorghums ready for shipment or for threshing. Grain sorghum is used as a concentrated food for livestock and poultry much as barley, oats, and corn are in other sections of our country. In 1919 the High and Low Plains of Texas and nearby portions of Oklahoma produced nearly 90 per cent of the total grain sorghums of the country; but by 1924 the acreage in Kansas had increased so that this state must be reckoned as one of the three important grain sorghum producers. Milo maize gives heavier yields of grain than Kafir corn. The yield of the former is from 20 to 40 bushels and the

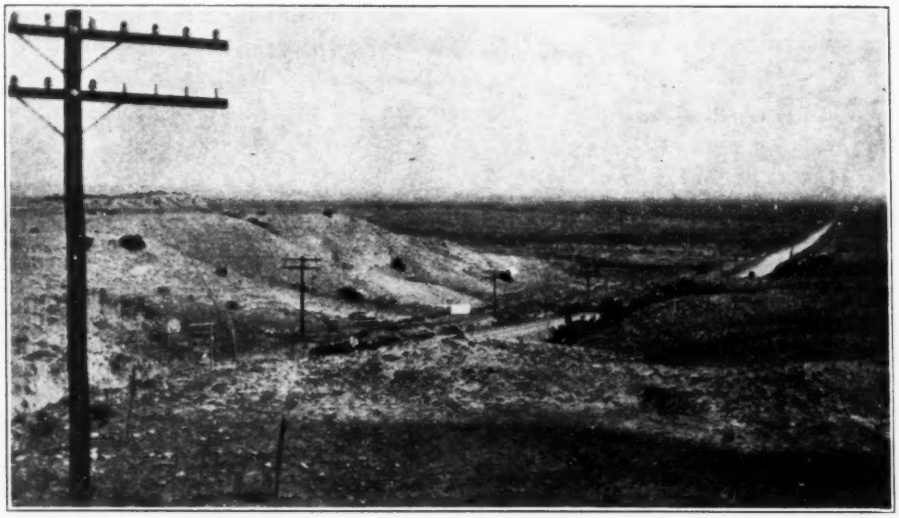

FIG. 6. The break of the plains. Eastern edge of the High Plains, near Post. This is pasture land. The lower ground is the dissected, generally sterile western edge of the Low Plains. Post was built largely by C. W. Post of Battle Creek, Michigan.

latter from 15 to 35. Milo may be planted later than Kafir, for it matures more quickly, but Kafir is probably more resistant to drought and rarely fails to yield profitable returns. Feterita is a new sorghum that was developed at the Agricultural Experiment Station at Spur, Texas, on the Low Plains. The Spur Station specializes in crops adapted to the semi-arid areas of Western Texas. Sudan grass is grown largely for fodder.

COTTON

Cotton is one of the newer crops of the High Plains Region, altho it was grown in the southeastern section as early as 1905. Its

culture is not especially favored by the climate as the short stalks and few bolls indicate; but the High Plains is beyond the boll weevil habitat. The yield in this weevil-free region with its deep fertile soils in most years is comparable or superior to that in the humid lands that suffer from weevil raids, even tho the rainfall is generally low. Many of the west Texan farmers have come from cotton regions; and consequently the practices followed in cotton growing are similar to those in other sections of the South. They had little to learn in introducing this crop into the semi-arid section.

Mexican labor, when obtainable, does most of the field work. Negroes are scarce in the High Plains. Some farmers use sleds for the collecting of late cotton, but most of the harvesting is done by hand. The sled does not separate the fiber and attached seed from the plant but pulls off the entire boll, as well as much other trash. The ginning of sled-harvested cotton calls for special types of machinery, and not all gins are so equipped. The yield of cotton per acre in the best years is comparable to the general yield of the other cotton sections of the South.

AGRICULTURE CHARACTERIZED

Agriculture, in general, as in other parts of the Great Plains, is of the extensive type—large farms, large-scaled operations, large machinery, relatively low returns per acre, but large returns per farm and farmer. Farming is slightly more of a game than in the humid area. The farmer has to contend with drought, strong winds, severe cold spells in the winter, and some insect plagues; but pests and plant diseases are undoubtedly less numerous than in the humid sections of our country, particularly in the warm or hot humid areas. The average annual rainfall for the region varies from 19 inches in the west to 22 to 23 inches in the east. During the dry years there may be only 10 or 12 inches of rain, in the wettest 32 to 35. Low rainfall years—departures from the normal—are no more frequent than in humid areas; but a decrease of 10 inches where the normal is 22 is more disastrous to crops than where the normal is 42. But the Great Plains farmer has adjusted his farming operations and his expectations to semi-arid conditions. He can tell you that it has not rained a drop in four or five or six months with much less despondency in his voice than will a Tennessee farmer who complains that water has not fallen for four weeks. The former is pre-

pared for the four or five months of drought, while the humid-land farmer is not. The High Plains farmer of western Texas has lean years and fat years, but so do the farmers in all other sections of our country. Evidences of prosperity are on every hand—neat attractive farm homes; modern equipment of homes and farms; careful cultivation; clean fence rows and corners; excellent school buildings; busy, well-kept towns and cities with fine public buildings, paved streets, and modern water and sewerage systems; the attractively equipped stores with goods as good in quality as in cities many times as large in the eastern part of the United States.

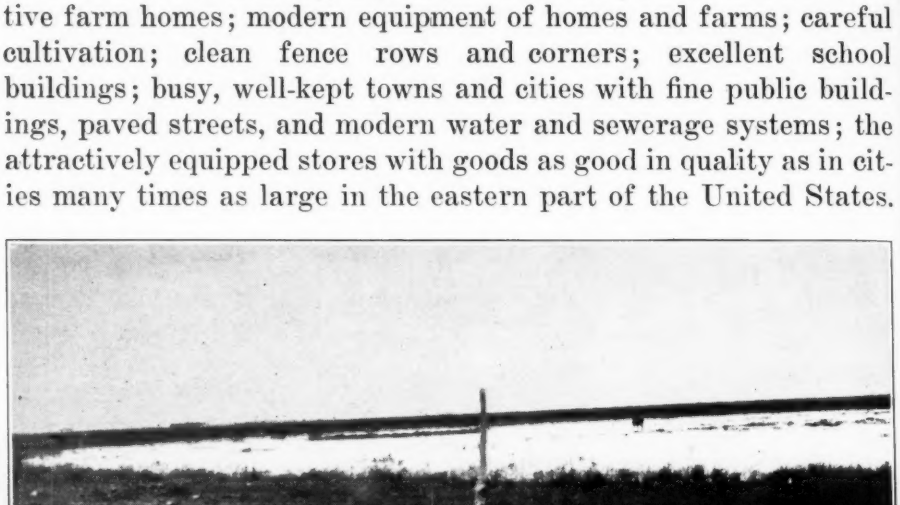

FIG. 7. A playa on the High Plains. Playas are fairly numerous. They vary greatly in size from season to season and year to year. In wet spells their area may be expanded several times that during dry spells. Playas were the earliest source of water in the High Plains, for livestock.

One cannot evaluate civilization correctly in this western country from the dot maps of the census takers. The dots are comparatively far apart for most material items; but so are the people. The per capita possession of world's goods is surprisingly high. Everything must be considered on a much broader basis than in the densely populated East, in this land of broad horizons and magnificent distances. There are single counties in the High Plains about as large as our smallest states, and the total area of the High Plains is as great as that of the average American state.

MINERALS

Shaler (quoted in the opening paragraph of this article) is wrong again in his prediction that manufactures could not develop in this land of aridity. Petroleum has been discovered in large quantities in both the northern and southern sections of the High Plains. Amarillo, Borger, and Panhandle are oil towns in the north; Midland, Stanton, Big Springs (on the edge of the High Plains), and others in the south. The United States Geological Survey is investigating the extensive deposits of potash in the southwestern portion of the High Plains. The effect of this resource on the industrial development in this region cannot be predicted, but oil has added tens of millions of dollars each year to the business of this section.

CITIES AND MANUFACTURES

The towns and cities in their industrial and commercial activities are reflections of the products of the farm, the ranch, and the oil and gas wells. There are elevators and grist and flour mills in the wheat section in the northern half of the region. In the cotton producing section cotton gins are common. Their newness is indicative of the recency of the introduction of cotton culture. They are equipped with the latest type of machinery. Those along high power lines use electric power. Amarillo, as a response to the production of fat cattle in the High Plains, boasts a packing plant. It also has oil refineries, the crude coming from the nearby field, and a carbon black plant that uses locally produced gas. Gas is used in a zinc smelter at Amarillo. The zinc ore is brought from Colorado and Mexico.

The rapidly accumulating capital derived from the oil industry (much of which remains in this region) assures us that other industries, designed largely to prepare locally produced products for market, will develop. Industries based on oil and gas are at best but short-lived, but those constructed to work up agricultural products are as stable as is agriculture.

Many agricultural adjustments to the soil and climate have been made during the last two or three decades. It is probable that the future of agriculture rests in the continued production of the drought-resisting sorghums and cotton. The economic evolution of the region has been rapid. Agricultural maturity has undoubtedly been reached, and the region is approaching industrial maturity unless minerals, now unknown, are discovered in the future.

SISAL PRODUCTION IN SEMI-ARID KARST COUNTRY OF YUCATAN*

ALICE FOSTER
University of Chicago

LOADING AT AN OPEN ROADSTEAD

All day long a dozen small boats, bending gracefully as the gentle northeast trade wind caught their sails, delivered sisal to the *Sokoto*. The vessel rode quietly at anchor in an open roadstead, without even a sheltering island to break the force of a storm, should one arise. Great cranes took the straw-colored bales from the boats, lifted them over the ship's sides, and lowered them into the hold. By nightfall the last of the 3,000 bales had been stowed away, and the ship weighed anchor. Then the sailboats returned to their haven at Progreso, the gateway thru which the sisal fiber of Yucatan is shipped to world markets (Fig. 1). Altho Progreso is a regular port of call for liners plying between New York and Vera Cruz, no ocean vessel ever ties up at its docks. They all anchor about three miles out, as did the *Sokoto,* and communicate with the port by means of lighters. The low, almost flat surface of Yucatan continues underneath the waters of the Gulf with a slope so gentle that only very small boats can approach the shore. Even at a distance of 15 miles from land, the water is only 50 feet deep.

MERIDA THE COMMERCIAL CENTER

Inland, 20 miles from Progreso, is the beautiful city of Merida, made rich by the trade in sisal. Merida is a city of stone and concrete, with tidy flat-roofed houses fronting on asphalt streets. Above the houses rise the slender towers and steel fans of American-made windmills. This city is the commercial and railway center for the 400 or more plantations distributed over northern Yucatan. Likewise, it contains the banks, wholesale houses, railway offices, warehouses, and small factories which serve the surrounding communities.

THE PLANTATIONS

On the plantations surrounding Merida, henequen, the "green gold of Yucatan," forms the cash crop, yielding the sisal fiber of

* Written as a reading for secondary school students.

commerce. Some of the larger plantations have their own stations on railways leading out from Merida, while others are connected with the main line by branch tramways. The plantation buildings in themselves form a fair-sized village. Besides the fine mansion of the planter and his family, accompanied by the ever-present

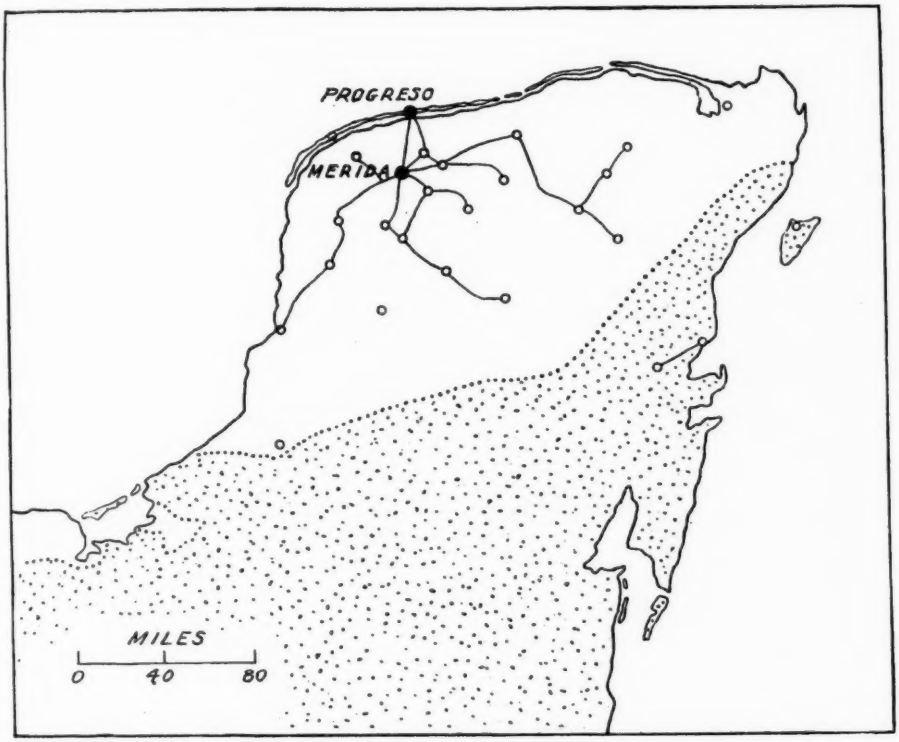

FIG. 1. The henequen-growing area of Yucatan. Settlement is confined to the northern part of the peninsula, the section shown in white on the map. Railways have been built to convey the sisal crop to Progreso. The railway pattern, therefore, indicates the approximate extent of henequen culture. South of the plantation area is a transition belt, where the surface is occupied by a scant growth of thornbush, scrub, and jungle. Gradually, the jungle merges into dense tropical forest, the extent of which is shown by shading.

windmill, there is a mill, or "central," to extract the sisal fiber, a group of cottages for the Indian workmen, and a store, where the laborers may purchase new tools, kerosene for their lamps, cotton goods, clothing, and foods to supplement those grown on the plantation.

In the fields, henequen plants, looking somewhat like overgrown pineapples, stand in stiff rows 4 yards apart. Each plant consists

of a central thick stem, bearing a rosette of spear-like leaves from 3½ to 5 feet long and 4 or 5 inches wide (Fig. 2). These leaves contain the commercial fiber. Wide spacing of the rows enables the workmen to go thru the fields at harvest time without being wounded by the vicious and slightly poisonous spines on the edges of the leaves; and it also prevents the fiber in the leaves of one

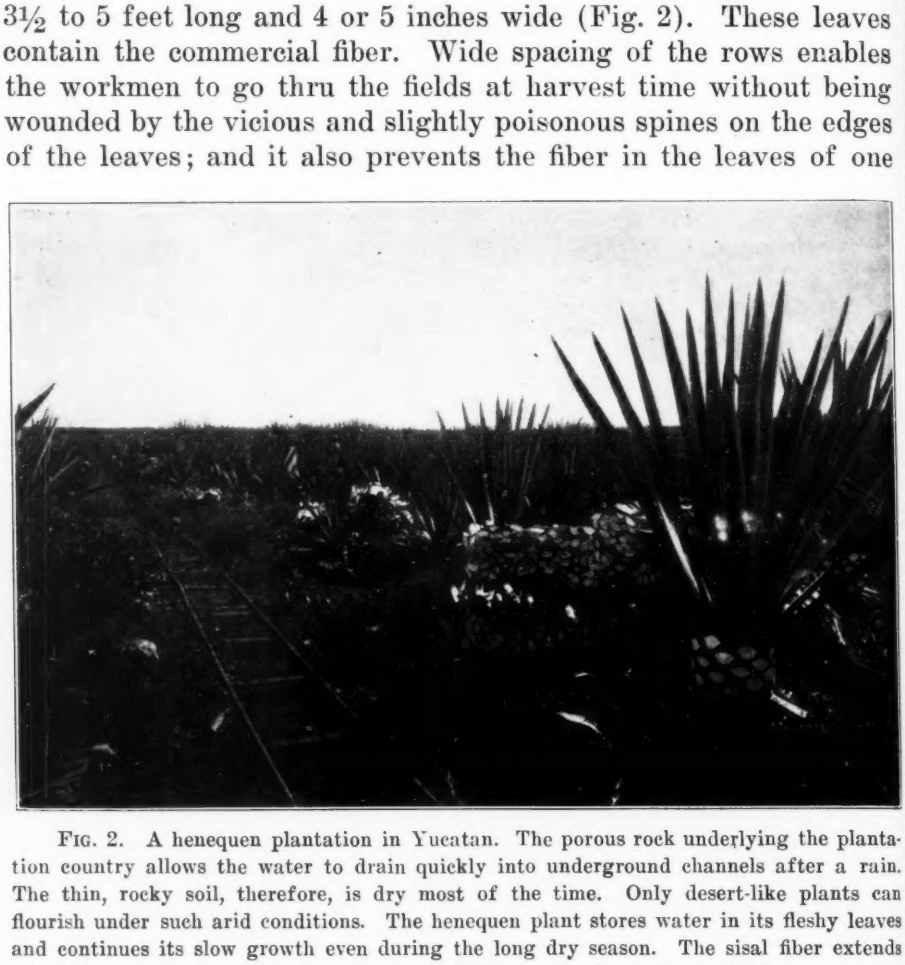

FIG. 2. A henequen plantation in Yucatan. The porous rock underlying the plantation country allows the water to drain quickly into underground channels after a rain. The thin, rocky soil, therefore, is dry most of the time. Only desert-like plants can flourish under such arid conditions. The henequen plant stores water in its fleshy leaves and continues its slow growth even during the long dry season. The sisal fiber extends the long way of the spear-shaped leaves. When ready for harvest, the leaves are cut and piled in bundles near the tramway. The lower leaves mature first, and the plant in the foreground shows scars, where leaves have been removed. (Courtesy of Eunice R. Blackburn.)

plant from being injured by thorns on the leaves of another. Light tramways connect the various parts of the estate with plantation headquarters for the purpose of carrying the harvested leaves to the central.

WHY HENEQUEN IS GROWN IN YUCATAN

Henequen is the principal commercial crop of Yucatan, and Yucatan is the largest producer of sisal in the world. Altho some

henequen is grown in northeastern Mexico, in Cuba, and in a few other places, most of the commercial crop comes from Yucatan. All of the southern and central parts of this large peninsula are in forest or jungle, and thus henequen culture is confined to the northern section. Four reasons account for the allegiance of this northern section to the culture of henequen.

Product in Constant Demand

One strong reason for the production of henequen in Yucatan is that cordage fibers for the manufacture of rope and twine are always in demand. The United States alone uses approximately 150,000 tons of binder twine annually for harvesting wheat and other grains, while Canada and the other grain-growing countries use large amounts. Sisal and manila hemp are the only satisfactory fibers for this purpose. In addition, much sisal is used for making the cheaper grades of rope.

Advantages of Location in Relation to Market

Yucatan has a particularly favorable location for supplying cordage fiber to American factories. Liners en route for New York from Vera Cruz go only a short distance off their most direct course in order to stop at Progreso; and sisal can be carried on passenger boats as part of a general cargo, since it is a clean commodity without disagreeable odor. Thus, with a relatively short and direct haul, the fiber goes to manufacturers of rope on or near the Atlantic Seaboard. Much sisal also takes the short route across the Gulf to New Orleans, and thence goes by rail or Mississippi barge to twine factories in the Middle West. The only competing fiber, manila hemp, must be brought from the Philippines, half-way round the world. Position favors the Yucatan planters, therefore, in placing their crop on the American market—the largest market for cordage fibers in the world.

Crop Suited to National Environment

In choosing a crop for northern Yucatan the planters are influenced by the fact that henequen thrives there, while other crops do poorly. In fact, the cultivation of henequen has brought prosperity to an area where without this crop men probably would be unable to make a living. Conditions of climate, drainage, and soil

combine to make northern Yucatan remarkably arid, but henequen, a desert-like plant, thrives in an arid environment.

The rainfall of Yucatan is too scant to supply the moisture needed by most crops, and there is a long dry season (Fig. 3). It is true that the annual rainfall of 35 inches is about equal to that in some parts of Illinois and Iowa. Under the intense heat of the tropical sun, however, evaporation is more rapid than in the Corn Belt, and thus much of the moisture escapes into the air instead of remaining in the soil to supply the roots of growing crops. Moreover, more than three-fourths of the rain comes in the five months from June to October, inclusive, thus giving the area a long dry season.

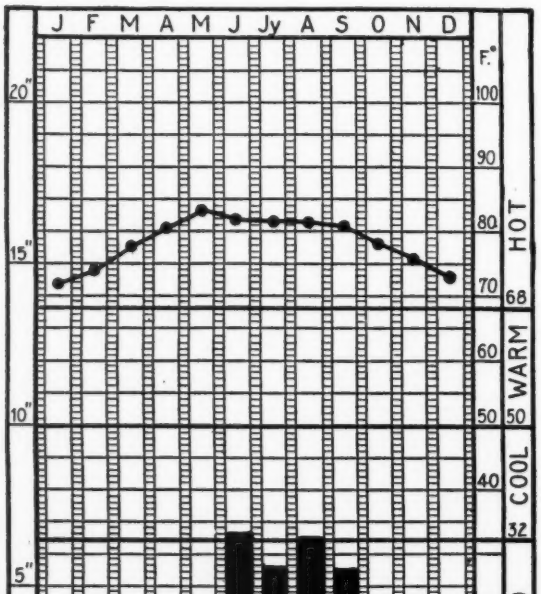

FIG. 3. Temperature and precipitation at Merida, Yucatan. Altho the total for the year averages more than 35 inches, northern Yucatan suffers from drought. The rainfall from November to May is scant, and the high temperature causes rapid evaporation. More than three-fourths of the annual precipitation occurs in five months.

Rock and soil conditions combine to make the land more arid, for they permit the water to escape downward as well as into the air. The soil is so thin, coarse, and stony that it fails to perform one of the important functions of a soil, namely, that of holding, like a great sponge, a supply of water for the roots of plants (Fig. 4). The large spaces between the coarse soil particles permit the water to sink rapidly into the ground. Yucatan, moreover, is underlain by a limestone rock in which the percolating water has developed numerous channels. The water runs to the sea in these underground channels instead of flowing at the surface as it does in most areas. In many places

the roofs of underground channels have fallen, and the streams may be seen at the bottom of the limestone sinks thus formed. Such sink-hole areas are spoken of as Karst areas or areas of Karst topography.

The scarcity of moisture in the soil of northern Yucatan makes the cultivation of corn and similar crops very precarious, especially since the rainfall varies greatly from year to year. Henequen, however, grows well under such conditions, for its thick stem and fleshy leaves, protected by a tough covering, long retain the water ab-

FIG. 4. Delivering henequen leaves to the central. The level surface of the Yucatan plain makes it practicable to lay tramways at convenient distances on the plantation. The bundles of leaves are loaded on mule-drawn cars and brought to small plants where the fiber is extracted. A particular field may be cut over two or even three times in a year, and thus, if a plantation is large enough, a continuous supply of leaves is fed to the extracting plant. As a result, sisal is exported thruout the year. This picture also suggests the thin, stony soil and the scant native vegetation. (Courtesy of Eunice R. Blackburn.)

sorbed during the rainy season. Henequen also conserves its water supply by growing very slowly. Not until the plants are five or six years old are the first leaves ready for harvest. This is in strong contrast to the rapid growth of the banana in its humid environment. Instead of being benefited by additional moisture, henequen is hindered in its development. After the first harvest, ordinarily a new circle of leaves matures every six months. When rains are heavier than usual, however, the leaves mature more slowly, and

the planter gets only three harvests in two years instead of the customary four.

Production at Comparatively Small Cost

A fourth reason for Yucatan's interest in henequen is that the crop is produced cheaply. This is due in part to the type of environment in northern Yucatan and in part to long experience in growing the crop. The work of preparing a field for planting is less than

FIG. 5. The long sisal fiber is extracted cheaply from the henequen leaves by machinery. The small amount of waste, together with the short or broken fibers, can be used for paper. (Courtesy of Eunice R. Blackburn.)

in more humid sections of the tropics. The native vegetation is much less abundant than in the banana country, for example, and if cut in the dry season it soon becomes dry enough to burn. Because of the scant rainfall, there is comparatively little trouble with weeds, and henequen is so long-lived that it needs to be replanted only about once in 15 years.

Harvest can be distributed over a long period, for the leaves mature with no regard for particular seasons. As a result, the laborers on the plantation can be employed thruout the year. When the plants are about five or six years old, the leaves of the lowest and oldest circle droop from their former upright position. At this stage, the fiber has its maximum strength, and the drooping leaves

are cut close to the body of the plant. When the thorns have been removed from the edges, the leaves are tied in bundles for transportation to the central (Fig. 2). The level surface of the land permits cheap transportation by tramways or by heavy two-wheeled drays (Fig. 4).

The operations at the central (extracting, drying, and baling

FIG. 6. Climate facilitates drying the sisal fiber. The weather is so fair and the sun's rays so intense that fiber hung on racks in the open air ordinarily dries sufficiently in one or two days so that it is ready for baling. (Courtesy of Eunice R. Blackburn.)

the fiber) are relatively simple. This is an important factor in producing the fiber at low cost. Machines extract the fiber from the pulp of the leaves (Fig. 5), and the fiber is dried on racks in the sun (Fig. 6). Sunny weather favors the drying process, and most of the days are bright. When the fiber is thoroly dried it is baled by machinery and is ready for shipment.

AMERICAN WINDMILLS SOLVE THE WATER PROBLEM

The conditions of the Karst country make the water problem difficult for people as well as for plants. In northern Yucatan, there

are no springs or rivers at the surface, and the underground streams are the only source of water supply. Before pumps were introduced into the country, all the settlements were grouped about the sink holes, where the water could be secured. Even at the present time, the inhabitants are dependent either upon the sink holes or upon wells. Under such conditions, a windmill to lift the water to the surface is a great boon. That is why Merida is a city of windmills, and why there are windmills on the plantations.

In connection with the drinking water problem, an incident which took place some years ago shows how our government is organized to help merchants and manufacturers increase their foreign trade. The United States consul at Progreso purchased an American windmill and had it set up at the consulate. He did this, not only for the convenience of his family, but also because he realized that the introduction of steel windmills would benefit the people of Yucatan and give American manufacturers a new market. It is part of a consul's business to watch for new trade opportunities for his country. The consul's windmill was an effective object lesson, for it could be seen briskly pumping away when the wind was not strong enough to stir the heavy wooden arms of the old Dutch-style windmills in general use. Soon American mills were being shipped to Yucatan to replace the inefficient old wooden mills.

What Sisal Means to Yucatan

In Yucatan, the sisal trade has brought prosperity to an area of small resources. Merida at once impresses the visitor with its wealth. Its streets are clean, its buildings well constructed, and the Indian laborers and their families, all clad in white, have a prosperous look. The prosperity of Yucatan grows largely out of its commerce with its middle-latitude neighbor, the United States; and its relations with the United States are based on the trade in sisal. In a recent three-month period, exports to the United States were valued at nearly $5,000,000, and sisal accounted for about seven-eighths of this sum. The value of the second export item, chicle, was less than an eighth that of sisal. It is the sisal export, therefore, which makes possible the import of commodities from other areas.

Thru its sisal trade, Yucatan is delivered from the isolation which otherwise would be its lot. Without sisal it probably would be left pretty much to itself, for it has no other product important

enough to attract ships to its harborless shores. Its land connections are blocked by a formidable barrier of jungle and tropical forest (Fig. 1), and Yucatan has but little intercourse with the rest of Mexico. It is so completely cut off that the people think of themselves as forming almost a distinct nation. It is sisal, their distinctive product, which gives them a place in the commerce of the world.

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SUMMARY OF THE FIRST SUMMER FIELD COURSE IN HIGH SCHOOL GEOGRAPHY OF THE NEW ORLEANS PUBLIC SCHOOLS

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New Orleans Normal School

I. INTRODUCTION: REASONS FOR ORGANIZING THE FIELD COURSE

The generally accepted definition and scope of geography as a school subject is: the interrelationships between the physical factors of the environment and all forms of life. Two elements are here involved: the physical factors of the environment and the forms of life. Since both the these elements are observable, the functions of the teacher of geography and of the geography text are secondary to observation. The main function of the teacher is to supply to the student the opportunity for observing the physical factors of the environment and all forms of life, and thru properly guiding the student in his observations and in his use of the text, to bring about an understanding of the relationships between the two elements.

Thus we recognize the importance of excursions in geography instruction: excursions and field trips are the laboratory method,

the natural method of geography instruction. This method of geography instruction is becoming increasingly recognized in the schools of the United States: most of the courses of study in geography recommend the use of excursions from the lowest to the highest grade in which geography is taught. New Orleans' location on an excellent harbor just beyond the tropics gives us a splendid opportunity for the type of school excursion which we undertook at the end of the last school year: a nine-and-one-half day cruise of tropical waters, including visits in Cuba and Honduras.

II. Recognition and Approval of the Course by Educational Authorities

The purposes and outline of the course were submitted to the school superintendent of Louisiana and to the superintendents of the larger towns and cities surrounding New Orleans. Written expressions of approval were received from the superintendents of education of Rapides Parish, Louisiana; Mobile, Alabama; Hattiesburg, Mississippi; and Tulsa, Oklahoma. The plans were submitted also to the principals of many of the private schools of the city; in every case they were approved, and in most cases cooperation was assured. Upon the recommendation of the city Superintendent, the Orleans Parish School Board granted to the course High School credit of one point or one-tenth unit to the students successfully completing the course. The field trip was thus made part of the New Orleans High School Curriculum.

III. Campaign for Registering Students for the Course

In introducing the course to the students and their parents, the following procedure was followed:

1. Explanatory leaflets were sent to eligible students thru the principals of their schools.
2. Moving pictures of Cuba and Honduras were shown in the schools where students expressed an interest in the course.
3. Talks were given at parents' club meetings.
4. Talks in their geography classrooms were made by teachers.
5. Personal visits and telephone calls were made wherever parents were interested.

As a result of this campaign which extended approximately from February to June, eight students were registered for the course.

IV. Outline of Lesson Topics

The list of topics as planned before the cruise was as follows:

1. New Orleans harbor.
2. Jetties; delta and lower course of Mississippi River.
3. Tropical climate: sun and temperature; length of day; rain; wind; etc.
4. Havana and Cuba: historical sketch; general climatic and surface conditions.
5. Harbor of Havana: shape; history; advantages and disadvantages.
6. Auto trip thru Havana and suburbs.
7. Observations of Havana trade: exports; imports; docks; etc.
8. Other parts of Cuba.
9. Puerto Castilla and other parts of Honduras; banana trade.
10. Trip into banana country.
11. Native life of Caribbean; historical sketch; trade conditions.
12. Ship inspection; problems of navigation.
13. Latitude and longitude; time at sea.
14. Comparison of the three harbors seen.
15. Sugar industry.
16. The ocean: movements; values; animal life.
17. Other Caribbean lands not visited: geographical conditions and life.

V. Conducting Classes Aboard Ship: Tentative Plans and Necessary Changes

Immediately upon leaving the docks at New Orleans, an informal classroom was set up on the promenade deck and lessons were begun.

Tentative plans made in advance were as follows:

1. To have two forty-five minute lessons daily, at 9:00 A.M. and at 2:00 P.M.

2. To conduct these lessons from the deck classroom.

3. To assign readings from geography texts and government pamphlets.

4. To require daily notebook work consisting of summaries of readings, solutions of geographic problems, map work, original paragraphs, and picture collections.

In the carrying out of the plans, however, it was found that many of the formal plans had to be modified or abandoned.

1. The time of meeting was variable, depending on current interest: often a formal lesson was unceremoniously cut short and the topic changed by the appearance of a storm cloud on the horizon, or the salute of a passing ship, or the sight of a whale-like fish, a school of flying fish or of porpoises. On the other hand, sometimes a lesson was prolonged to several times its length, as in the case of all day shore excursions, or in the case of the all-morning inspection of the ship with talks by the captain on problems of navigation. Sometimes an interested passenger asked to take over the discussion, as in the case of a passenger who was present at the naval ceremony of the burial of the sunken battleship Maine.

2. With only eight students forming an intimate group, it was sometimes expedient to conduct a lesson from almost any place on board except a formal classroom: as, from the music room lounge; from a group seated kindergarten fashion on the floor of the deck; from a group standing informally at the rail, or around a map on the floor or wall. Also, much individual and group instruction was necessary because of the lack of uniformity in the age, preparation and interest of the students.

3. Advertising material and other material gathered on shore trips were often more vital, picturesque, interesting and practical than formal geography texts; by tacit agreement they were accepted as substitutes for the text.

VI. Conclusions as to the Educational Value of the Course

The claim was found to be true that the field trip or laboratory method of teaching geography is a most efficient method:

1. In giving clear, forceful pictures of actual physical and life conditions on the earth.

2. In giving clear understanding of such difficult mathematical conceptions as latitude and the varying angle of the sun's rays, longitude and time changes, appearance and disappearance of heavenly bodies as we move over the earth's surface.

3. In popularizing the subject of school geography by removing it from the pages of the text and placing it in the pages of life.

4. In giving students an appreciation of the vocational opportunities offered by their own and other cities.

From every educational standpoint, it was a success.

VII. PLANS FOR THE FUTURE

In view of the professional enthusiasm which this New Orleans experiment has awakened, and the support which has been given it by school authorities, the course will be repeated at the close of the present 1929-30 school term.

If the enrollment shows an increase in numbers and thus indicates an increased demand for this type of instruction, the course will continue to be offered from year to year.

Plans for the 1929-30 presentation of the course include the following:

1. Possible reduction in the cost of the cruise, and possible increase in the amount of high school credit earned.
2. Carrying out of the same campaign for enrollment.
3. Use of the same lesson plans, enriched by this year's experience and by the addition of those interesting and picturesque details which were found to appeal to students.
4. Use of kodak pictures in notebook work. Use of an even greater profusion of pictures, maps, current literature, government and tourist literature in instruction and study.
5. Use of a "double treatment" of every lesson topic thru lecture before the experience and discussion after it.
6. Continued insistence on notebook and other definite requirements for high school credit; increased requirements, if it is possible to plan for and obtain increased credit.
7. Planning for more numerous and more varied study and recitation devices: as, map and picture studies of a puzzle and game nature; note books of a diary and scrapbook nature.
8. Greater adjustment to individual differences; forming of more definite study groups depending on age and preparation of students.

In a word, in looking over the experiences of this first New Orleans public school field course, it seems that the secret of successful laboratory instruction in geography is this: to seize the opportunity for instruction as it arises, rather than to follow inflexible plans; to be "on the job" always, not only at lesson times. Definite objectives must be kept in mind; definite subject matter must be covered ultimately; but the course must be so conducted that it is, in effect, not one of eighteen forty-five minute periods, but one of nine-and-one-half twenty-four-hour days.

GEOGRAPHY AS A LIFE CAREER

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Big projects from little problems grow. At least that proved to be the case when seventh grade geography pupils were confronted with the problem of preparing a general assembly program on the subject "Geography as a Life Career." Research in both the school and public libraries revealed the fact that no printed material was at the immediate command of the class. It was at this point that the problem began to assume the proportions of a project. Questionnaires had to be made out. Facts obtained by this method had to be organized. The program had to be planned and rehearsed.

Without going into detail, suffice it to say that questionnaires were sent to individuals who are actually pursuing geography as a life career, and to business concerns by which geographers were thought to be employed. The following report, made up entirely of information received in response to the questionnaires and of quotations taken from an article dealing with the subject, contains answers to such queries as these: What types of employment are open to geographers? What joys are to be derived from pursuing geography as a life career. The report does not pretend to be a final or an exhaustive study of geography from a vocational standpoint. Indeed, its chief value lies in the fact that it may arouse interest in geography as a life career and stimulate pupils and teachers to a further investigation of the subject.

GEOGRAPHY AND A BUSINESS CAREER

There are wide fields open to students who combine a general knowledge of other subjects with geography; as, positions in export houses, express and transportation companies, tourist agencies, commission houses, banks, packing houses, and publishing companies. That such industrial and commercial enterprises as those listed in the preceding sentence are becoming conscious of the necessity of having geography experts on their staffs, is evidenced by statements taken from the letters in answer to the questionnaires. The source of the following information is acknowledged in a general way at the beginning of each paragraph.

University Professor: The owner of a tourist bureau needed a young man to start in his office and grow with his business. He came to this particular university because he knew we were giving work in geography, and he secured the services of one of our most capable seniors, taking him into service as soon as he had been graduated. The tourist manager was going to send the young man to New York to get acquainted with ships and shipping, and give him every opportunity to advance as rapidly as his ability, diligence, and trustworthiness warranted.

Tourist Agency: I can only say that as far as this particular concern goes, a person with a good knowledge of geography would be particularly valuable only if he or she had in addition to such training, a knowledge of traveling conditions in Europe and the ability to typewrite. The most valuable experience for work in a travel bureau is actual travel. Many persons now engaged in this work obtained their experience by organizing groups for European trips and, while abroad, watching the methods of the courier and noting the way in which arrangements were made.

University Professor: I know that some of the packing companies have in their research department men giving their whole time to studying the problems of meat supply from a geographical point of view. The research worker correlates the demand for meat with climatic conditions, economic conditions, etc. The man whom I know in this position is a first class geographer, but I believe he has gone into it in the office by simply seeing the opportunity and then getting his training as a part of his work.

Meat packing Company: Every one here has some need for geographical knowledge, but no special geographers are employed. Our traffic department probably has the most need for geographical knowledge. Stenography and business training should be combined with a study of geography, and business experience is a point in favor of the applicant for a position in this company.

Map Publishing House: We have at present no position open to applicants who are specially trained in geography. In addition to a knowledge of geography in general it would be of special advantage, in our business, for one to understand cartography and to have had some experience in laying out maps.

Bank: This bank does not have on its staff anyone occupying a position which may be entitled, "Geographical Expert." However,

the office of the economist gives considerable attention to topics which may be included under the head of Commercial Geography, in the preparation, from time to time, of reports on economic conditions in certain foreign countries. The gentlemen, however, who prepare these reports do not consider themselves geography experts and do not make geography their life careers.

GEOGRAPHY AND GOVERNMENT SERVICE

Government positions which are open to persons trained in geography include one or more in the Geological Survey, the Coast and Geodetic Survey, the Hydrographic Office of the Navy Department, the Department of State, the Bureau of Census, the Bureau of Agricultural Economics in the Department of Agriculture, and the Division of Maps in the Library of Congress. If teachers and pupils will examine the latest edition of the *Congressional Directory,* they will discover the opoprtunities offered geographers by the United States Government. Since most of the vacancies which from time to time occur are filled thru the Civil Service, those interested should have their school placed on the mailing list of the United States Civil Service to receive notice of examinations for positions in the various departments of government.

Concerning the joys to be derived from pursuing geography as a life career one government employee wrote:

> It would be difficult to cover the many joys derived from my work in geography. While assistant professor at the University of Missouri, I had in my classes men from the School of Business and from the University as a whole who seemed to enjoy the work immensely. Some of them, who are holding important business positions now, have told me within recent months that the courses in geography have provided them with valuable background upon which to base business judgments. These courses also have given them a broad grasp of facts of value in handling business problems.
>
> The work in the Department of Commerce has been an interesting development. It has been my privilege to create here for the Department, a Geographic Section for business and professional people, covering the map field and other technical aspects of geography, such as climate and soils. Our work keeps us constantly in touch, through advice and services rendered, with all the map publishers and distributors throughout the country, and with the domestic distributors and export activities. We have enlisted the co-operation of all the sixty foreign offices at the Department of Commerce, scattered throughout the world, and of the District offices of the Department of the United States. It is difficult to express in a few words the satisfaction of creating a new field for geographers and the pleasure derived from the constant contact and co-operation with business men throughout the country.

The experience of this geographer is in line with one of the reasons why a young man or woman may well consider geography as a life pursuit, given by H. P. Little in an article entitled "Geography as a Profession."*

> . . . . Those who enter the subject now are on the "ground floor" as it were, in a movement which promises to be of much educational and economic importance. The opportunities for original discoveries and contributions are great. With their accomplishment comes the reward which the consciousness of having added to human knowledge always brings. The full power of this needs to be experienced to be understood. There is also the additional satisfaction which comes from being a pioneer in the development of new aspects of an important subject.

GEOGRAPHY AND THE TEACHING PROFESSION

On the subject of teaching geography as a life career H. P. Little, in the same article, made the following statement:

> Men can not take advantage of the preceding opportunities without adequate training. At this present moment, universities are handicapped in giving this because of the lack of trained teachers. The supply by no means meets the demand. The student who prepares himself to teach university geography is taking advantage of one of the best opportunities in the entire pedagogical field and rapid promotion is certain for him if he deserves it.

Geography professors in teacher-training schools and in universities assert that there is a demand for special teachers of geography in junior and senior high schools. A teacher can afford to specialize in geography, if the state in which he or she expects to seek a position is organizing a good many junior high schools with geography as a special subject. "Teachers are also sought as departmental instructors in one or more grades where the junior high school system does not prevail," stated one professor.

Advantages of the geography teacher over teachers of other subjects, according to one junior high school teacher of geography, are numerous. Since geography is such a live subject, it is interesting to teach; and since it is the broadest of all subjects in the curriculum in its scope, it can be made interesting to almost any type of pupil. Furthermore, the geography teacher has attractive aids for instruction; such as, moving pictures, maps, globes, museums, and reference material of all kinds. A geography teacher must travel, therefore she gets to see more of the world. Finally, because geography is a subject that requires constant study, the geography teacher is assured of obtaining a broad education.

* *Science*, N.S., Vol. 55, April 7, 1922.

GEOGRAPHY AND EXPLORING EXPEDITIONS

Besides teaching, field work with scientific exploring expeditions is probably the most commonly known vocation open to geography experts. Quoting H. P. Little again, we learn that the opportunities offered in this field are by no means small:

> Although the world is commonly thought of as pretty well explored, the facts are that many large areas even on our own continent are known only very superficially. Skilled geographers are needed to accompany scientific exploring expeditions, and with the increasing need of tropical products, the demand for such men will increase.

CONCLUSION

Readers of this article will no doubt draw various conclusions as to the present-day demand for geographers and as to the advisability of encouraging students to prepare themselves for geography as a life career. Among the outstanding conclusions which may be reached from this very brief survey are:

First, public schools and higher institutions of learning, departments of government, and expeditionary enterprises hold out to geography students the largest number of opportunities for employment.

Second, there is little demand for geographers, "labeled" as such, in the so-called business world, altho there is a demand for individuals who combine a general knowledge of other subjects with geography.

Third, in spite of any disadvantages which may attend the vocation, the testimonials presented by geographers convince us that there are few professions more appealing and worth while, few from which more real joy and satisfaction may be derived.

In general, geography as a life career merits the serious consideration of every student who is vitally interested in the subject.

APPROACHES TO A FIFTH GRADE STUDY OF INDIA

PAULINE R. POWERS
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India, in spite of recent efforts either to exploit or to condemn it, probably still remains to the average American *adult* mind a land of mystery, of few contacts with his own country. To the *fifth grade pupil,* India could be expected to offer very little which has even remotely touched his experience.

Seeking a less pedagogic approach and hoping to achieve a more natural one than I had formerly used in an introductory study of a country, I asked the children to find the map of Asia in their geographies and then to locate India.

"Why not figure out what we can about this far away land before reading the text at all?" I suggested.

"Let us find the island south of India." (Ceylon) "Have you ever seen this name on a package at the grocery store?" (On tea.) "We have found out then that one of the products of India is tea."

"Judging by the size of the type, what is the biggest city on the southeastern coast of India?" (Madras.) "Have you ever seen this word before?" (On a label pasted on cotton cloth.) "If the climate of India is suitable for tea-growing, would cotton grow there? To what countries might India export raw cotton?" (England, France, and Japan.)

"Locate the equator—then look at India. Do you think that cotton cloth would be worn much by the Indians? Why?"

"Look at the mountains on the northern border. What have you heard or read of them?" (The Himalayas are the highest mountains in the world and have the highest peak—Mt. Everest. It is so high that no one has ever yet been able to climb to the top. People have lost their lives trying to do so.)

"Notice the name of the bay off the east coast of India." (Bengal.) "There is an Indian province called Bengal, also. Have you ever seen this word before?" (At the circus and at the zoo on the tigers' cage, it said, "Bengal Tigers.") "Where do you suppose these tigers came from? Where did they live before they were captured?" (In the jungles of India.)

"Have you ever heard of the Jungle Books? Rudyard Kipling

wrote them. He was born in India of English parents. He wrote stories about the tigers, leopards, jackals, elephants and snakes of the Indian jungle."

"Judging again by the size of the type, what is the biggest city in all India?" (Calcutta.) "Is it the capital?" (No, it is not starred.) "Calcutta was *once* the capital—what is the capital *now*?" (Delhi.) "Why do you think the government moved its headquarters north?" (It would be cooler there.)

"Look at the northern part of India. Do you see any familiar word there?" (Kashmir. A boy told us that his mother had a Kashmir—"Cashmere"—shawl which had once belonged to her grandmother to whom it had been brought by a sea captain on his return voyage from India.) "Cashmere is a warm cloth made from the hair of a goat that lives in the Himalayas," I contributed.

"Now are there any other names here that you have ever seen or heard before?" (Mandalay. We have a record with the song Mandalay and we have heard it on the schoolroom Victrola.)

"Let us play this record now and listen to what it will tell us about India. The words of this song were written by the same Rudyard Kipling who wrote the Jungle Books of which we have just spoken."

As the rich bass voice sang on,

"There's a Burma girl a-settin' "—I interrupted to ask: "Can you find Burma on your maps?" (In eastern India.)

"For the wind is in the palm trees, an' the temple-bells they say"—

"What words here give us a hint of the climate of India?" I asked. (Palm trees.)

"Bloomin' idol made o' mud
Wot they called the Great Gawd Budd"

"What do these lines tell about the religion of the Indian people?" (They are followers of Buddha.)

"Come you back, you British soldier; come you back to Mandalay."

"Why should a British soldier go back to India?" (Great Britain is India's mother country.)

The lines:

"When the mist was on the rice fields," and "Elephants a-pilin' teak" revealed two valuable Indian products.

Someone now suggested an Indian exhibit and in a few days our table held:

A package of Ceylon tea
An elephant made of Indian ivory
Opium (Borrowed from a school of pharmacy student)
Baluchistan rug (of pagoda pattern)
Cashmere shawl
Cinnamon, nutmeg, ginger, pepper
Teakwood glove box
Silver handled, turquoise studded pen knife

India, the far away, the mysterious, the unreachable! In reality here it was at our very doors in story and in song, in rugs, shawls, jewels, trinkets, spices and tea. So far, and yet so near!

It was a pleasant and an interesting discovery and it intrigued us to a further and more detailed study of what could have meant just another one of those routine geography assignments.

INTEREST-STIMULATING DEVICES

Progressive Game

Properties. If there are forty pupils in the class have ten sets of the alphabet printed on paste board. With four pupils at a desk and a set of the alphabet at each with the letter side down, the game will be ready to start.

Let us suppose the teacher asks for the cities of Europe. One pupil at each table will flip a card over and the first one to guess a city beginning with that letter gets the letter (card). This is done until all the letters are held by somebody at the table.

When all the "tables" have finished, the two pupils having the highest number at each will leave their letters at the table and progress to the next table.

The letters are turned down again and the pupils are ready to start on the second question which may be—our imported food, or animals of Africa, or rivers of the United States, etc.

It is a noisy game but lots of fun.

Alphabet Game

Properties. Two sets of the alphabet with letters about five inches high either painted or pasted on card board.

Divide the class and have them stand on opposite sides of the room, as, the north and south sides. On the north side, beginning at the right, give the first pupil "A," the next "B," etc. (Omit the uncommon letters if the class is small.) Do the same on the south side, giving "A" to the pupil on the right. You will notice the "A's" will be diagonally across the room from each other. Use the same letters in each line. If there be an extra pupil, let him keep the score.

As a word or question is given those of the north side who have the letters for the answer run to the west side, and the ones of the south side run to the east side and stand so their letters spell the word correctly. The side with the letters in correct order first is the winner. Pupils will then return to their original places for the next question.

Illustration. What is the capital of France? Those in both lines holding P-A-R-I-S will run. About twenty such questions on cities, countries, rivers, etc., make an exciting and profitable game for children or adults.

Note. Care should be taken to use words that have only one letter of a kind.

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Send your devices to the Editor. We will be pleased to publish more plans that have been found to be helpful.

EDITORIAL NOTES AND NEWS

A slow but profound change is taking place among the native inhabitants of Arctic Canada. The use of modern high power rifles and other hunting equipment combined with the extensive competition for furs and consequent depletion of wild life are all combining to make the people of this region more and more dependent upon outside supplies for food and clothing. The Canadian Government is alert to the situation and is looking forward to prevent any possible disaster. As a result of their plans one of the largest reindeer drives in history is now under way. Last fall officials of the Canadian Government purchased 3,000 head of reindeer in the Kotzebue Sound district of Alaska, and near the end of October started the long trek northeastward to the headwaters of the Noatak River; then over the divide by way of Colville Pass. It is planned to spend the fawning period next spring in the Colville Basin. Only limited progress eastward can be made during the summer. During the next winter a route north of the Endicott Range will be followed, and it is planned to reach and cross the Mackenzie River in the early spring of 1931 so that the fawning season of that spring will take place on the east side of the river. This will help to fasten the herd to their new home. This great drive is in charge of three Lapps and six Eskimos. Fifty-three sledges drawn by domesticated reindeer are used in this long trek. Airplanes are also being used in connection with the long drive. Investigations show that the 15,000 square miles between the Mackenzie and Anderson rivers of northern Canada can support at least 250,000 reindeer. This is only a small part of the total potential grazing lands of northern Canada. Under favorable conditions reindeer double in numbers in three years. As the numbers increase it is planned to distribute them to other centers thruout the vast tundra country. Preparations for receiving the large herd east of the Mackenzie are already under way. Material for corrals, buildings, and other equipment was shipped down the Mackenzie River last summer. There are indications that several million head of reindeer may be produced and slaughtered annually in the vast arctic meadow land of Canada.

In past years commercial airway development in Europe has been considerably ahead of the United States. However, the time has arrived when the situation is reversed. The development has been so rapid that most of us scarcely realize the enormous progress that has been made. Complete reports for 1929 are not yet available but preliminary estimates present some interesting figures for contemplation. It is probable that the number of miles flown on fixed commercial airways during 1929 will exceed 16,000,000 miles. This is more than twice that of any other country in the world. There are now 35,000 miles of fixed airways in the United States, 12,500 miles of which are lighted for night flying. Approximately 82,000 miles are flown daily. This is more than twice as many miles as were flown daily in the eleven chief European countries in 1928. It is estimated that 8,000,000 pounds of mail and 85,000 passengers will be handled upon the commercial airways of this country during 1929. None of these figures include

private flying, navy, military, or taxi service, etc. It is estimated that such flying amounts to 90 million miles annually. These figures are indeed astounding when we realize what a short time ago it was when the flying of an airplane between two cities was "front page news" in the newspaper. It seems only a matter of a short time when excellent service will exist between all important cities of the United States, assuring comfort, safety, and speed both day and night, and in all kinds of weather.

A system of dams, power houses, canals and river dredging is now in progress which when completed will make a continuous waterway from the Atlantic Ocean to the Black Sea. This will follow the route of the Rhine, Main, Danube rivers, and will give a waterway service to the very important Nuremberg industrial area. Much of the work in the Danube area is now completed, and during 1928 nearly 5,000 tugs, barges, and other ships used the waterway. At present the work is being pushed rapidly on the section from Aschaffenburg to Wuerzburg. The dam and locks at Obernau are complete and in operation. The power house will be completed soon. A similar set of works was completed during the present year at Kleinwallstadt. There are nine more units each with a dam, lock and power house to be completed between Aschaffenburg and Wuerzburg. It is expected that all of these works will be completed by 1937.

It is interesting to note that not all tourists go to Europe. Canadian estimates indicate that two and a half million visitors, and approximately 700,000 automobiles visited Ontario during 1929. It is estimated that the expenditures of these tourists was about $150,000,000. The tourist traffic of 1928 was considerably less but during that year tourists contributed $764,000 in gas taxes, hunting and fishing licenses, and similar items.

Ethiopia, the official name for the country long known as Abyssinia, dates back in history farther than any African country except Egypt. It is supposed to have been the home of the Queen of Sheba. The relative inaccessibility of this mountainous country has helped to maintain its independence. In recent years it has become strong enough to push its frontier into some of the nearby lowlands, much to the anxiety of the peoples living there.

Dr. C. C. Colby of the University of Chicago lectured at a recent well-attended meeting of the geography section of the Wisconsin Teachers Association. From now on, this section of teachers will also function as a State Council of Geography Teachers. C. A. Whitney of La Crosse Teachers College succeeds L. H. Halverson of the University of Wisconsin as chairman, and Dr. V. C. Finch of Madison represents the new organization on the Board of Directors of the National Council.

The Minnesota State Council holds no meeting this year because of a general change in state plans for such meetings. However, topics of geographic interest were discussed at various sectional fall meetings of the state education association. Vilhjalmur Stefansson lectured at the Duluth meeting; Dr. Richard Hartshorne of the State University and Cora P. Sletten of the Mankato State Teachers College were on the Twin City program; Prudence Cutright of Minneapolis talked at the Mankato meeting, and R. J. Scarborough of Winona State Teachers College conducted an excursion to Garvin Heights, and his students prepared an exhibit of geographical materials.

The Natural Resources Intelligence Service, Department of the Interior, Ottawa, Canada, has just issued a new 1929 catalog of publications. The publications deal with the natural resources of Canada and the problems connected with the development

of these resources; general and detailed descriptions of tourist routes; a great many maps showing various physical, political, and cultural features. Many of these publications are free to schools.

This is the fourth consecutive year that the Nebraska Geography Council continues its publication of a five page bulletin of aids in teaching geography. The five yearly copies of the Bulletin may be had for 25 cents from the Secretary, Emily Peterson, Lincoln, Nebraska.

The South Dakota Geography Council reports an interesting meeting held recently at Rapid City in conjunction with the State Education Association. In addition, sectional meetings are held at several places in the state. The Council is seeking to promote higher training of its elementary geography teachers, and with that in view is interested in ascertaining the opportunities for training in the field of geography afforded at the various State teacher-training institutions. Gertie Belle Rogers, the State Director of the Council, is cooperating with the State Department in the revision of the State Course of Study. Geography will appear as a separate subject in the curriculum.

The Geological Survey has just published a new base map of California printed in two sections and in two colors. The map shows state, county, and township lines, Indian reservations, national monuments, railroads, streams, cities, and villages. California contains the highest point in the United States, Mt. Whitney, 14,496 feet above sea level, and also the lowest point, Death Valley, which is 276 feet below sea level. These two points are only about 86 miles apart and present an altitude range of about 2.8 miles.

Argentina is primarily an agricultural and pastoral country. Its limited resources of power and iron are unfavorable to the development of manufacturing. At the present time about three-fourths of its manufactured products are imported. No census has been taken in Argentina since 1914 and hence exact data are not available but there is plenty of evidence that manufacturing is increasing in spite of the natural handicaps. The production of such products as shoes, cotton stockings, leather goods, purses, cotton underwear, saddles, has increased to such an extent that it is practically impossible to import goods in competition with the locally manufactured ones. Power is derived largely from coal which is imported and much of the raw material for manufacturing is also imported. Meatpacking is perhaps the largest manufacturing industry. Most of the manufacturing industries have been built by capital from the United States and Great Britain.

Recent estimates indicate that there are 28,500,000,000 tons of coal in the Ruhr District of Germany within a depth of about 3,200 feet. At the present rate of production this coal would last approximately 280 years.

Uruguay is a land where the live stock industry overshadows all other occupations. Its great pasture land producing cattle, sheep, and horses are a great source of wealth. Estimates made last summer give Uruguay 9 million cattle and nearly 19½ million sheep. There are also about a half million horses, and a quarter of a million hogs. The great cattle market of Uruguay is on the outskirts of Montevideo and is maintained by the Government. The Government also maintains broad cattle roads leading to this market from all parts of the country. At present there are three large packing houses in Uruguay, two of which are American owned and one British owned.